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(54) Improvements in children's safety seats

(57) A child's safety seat, particularly for motor vehicles, consists of a cushion-like shaped part 10 made of flexible plastics material, with a seat portion 11 and support walls 12 on both sides, the shaped part having means 13 for the attachment and/or guiding of a safety belt. To ensure that the child will not suffer from accumulations of heat, even during a lengthy journey, and to provide uniform comfort for children of different ages and hence different body weights, a seat base 20 in the form of an air-permeable cushion is fitted into the shaped part 10. In addition, the shaped part 10 is provided, in the region of its base surface 15, with continuous channels 17 which allow the circulation of air through the channels 17 and the air-permeable seat cushion 20.

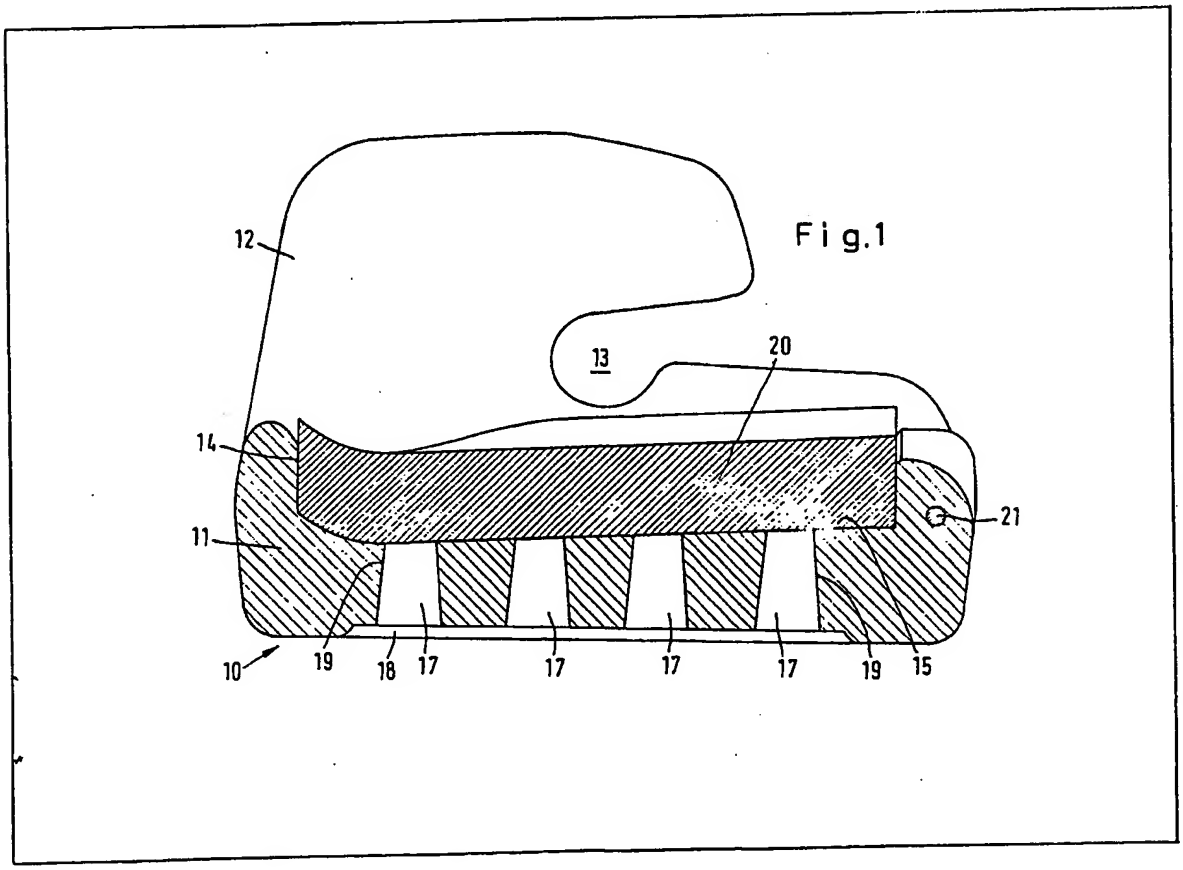

Fig.1

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Fig.1

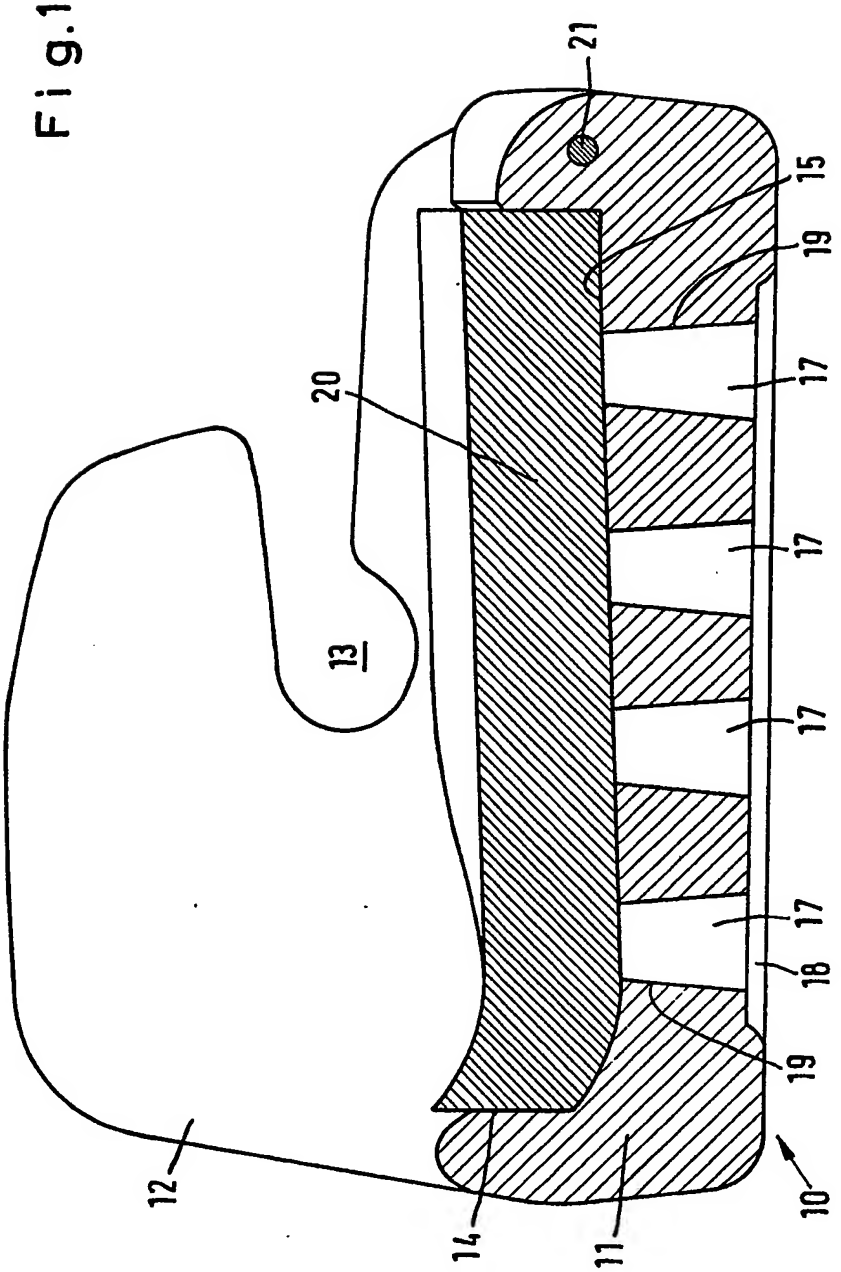

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Fig.2

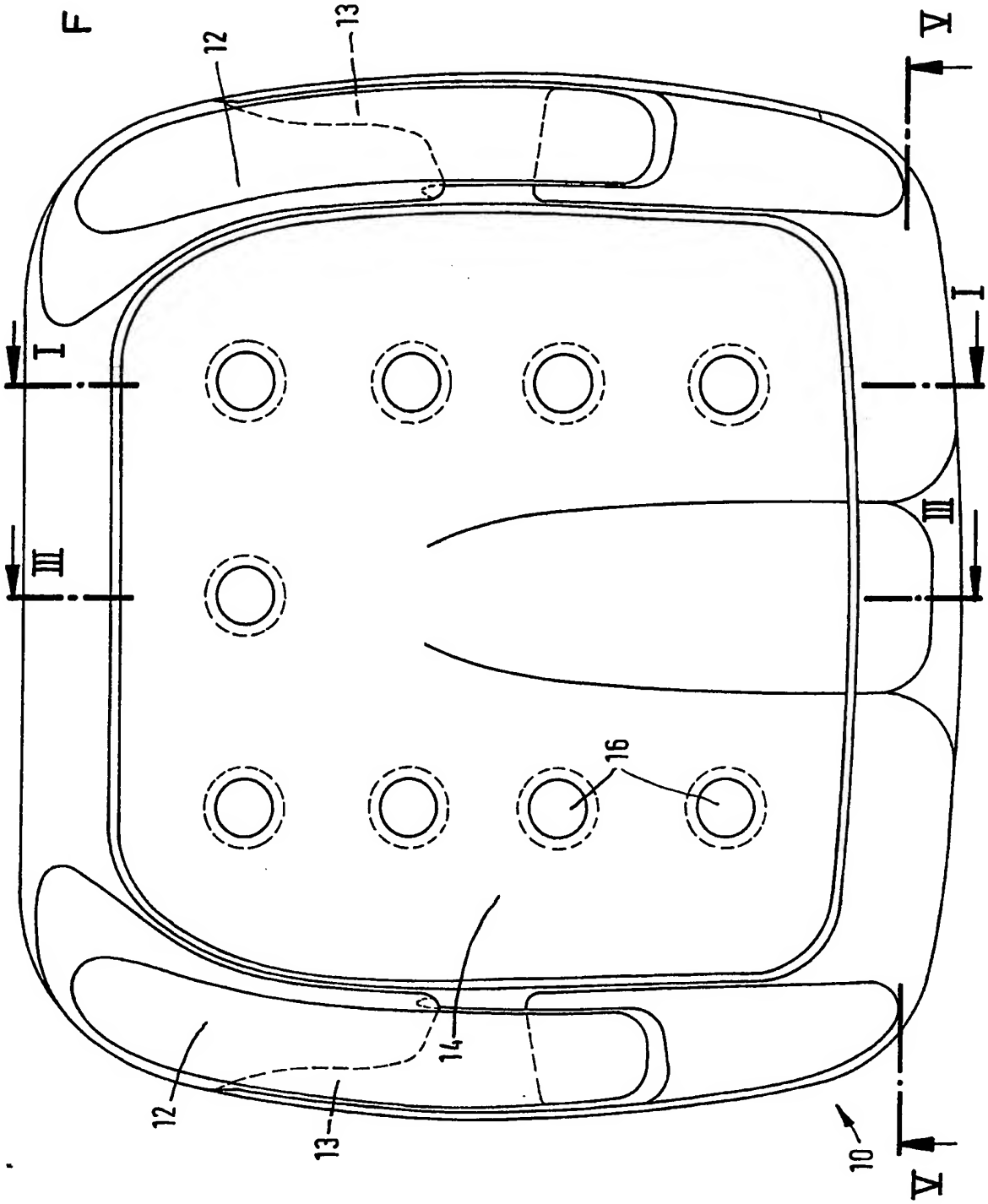

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Fig.3

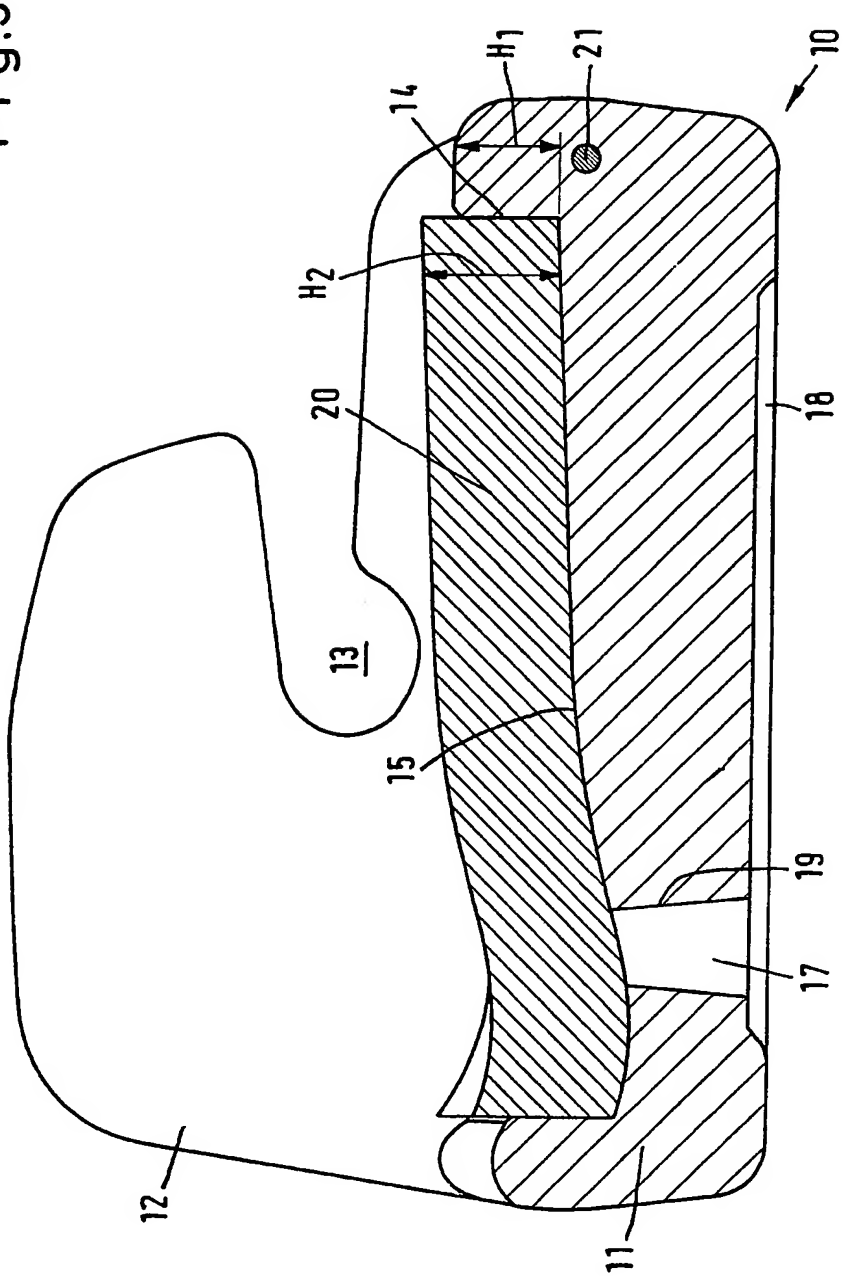

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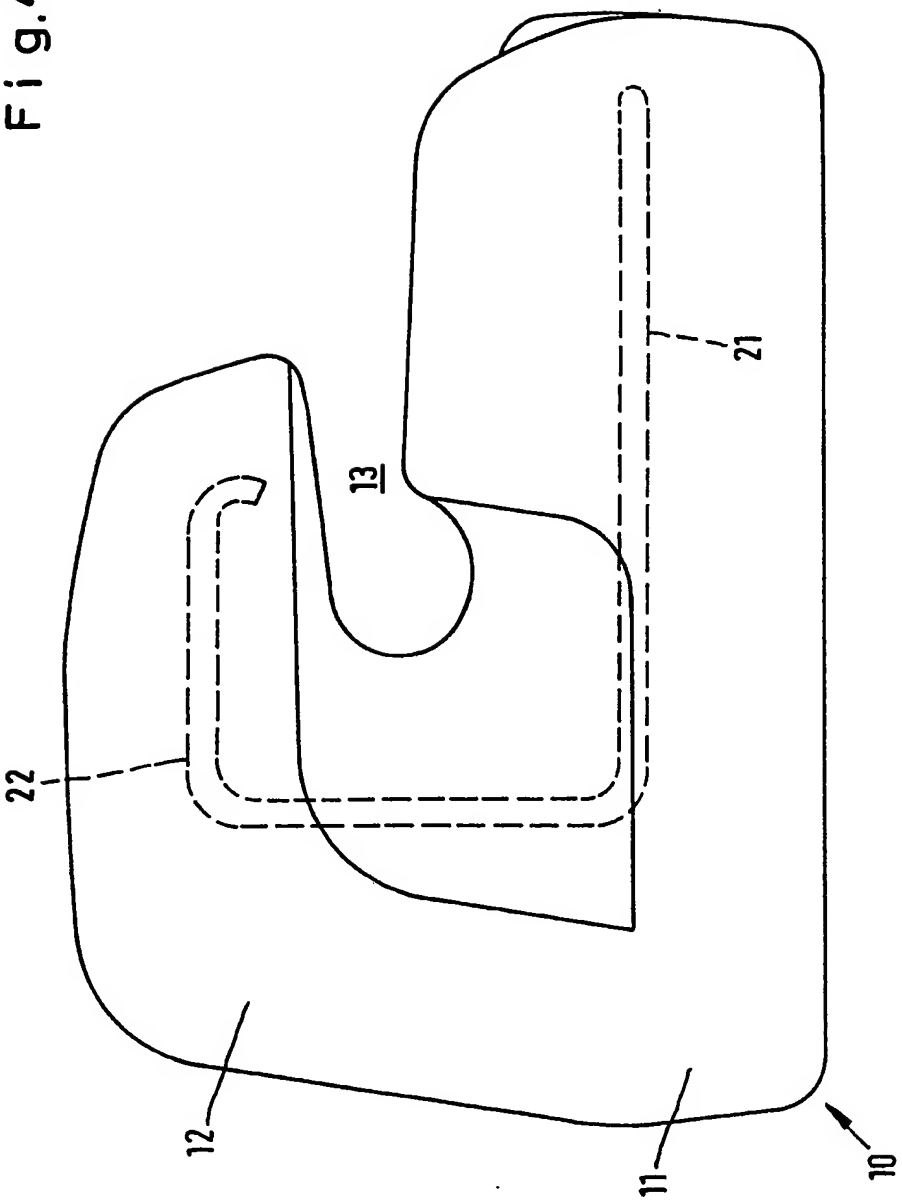
Fig.4



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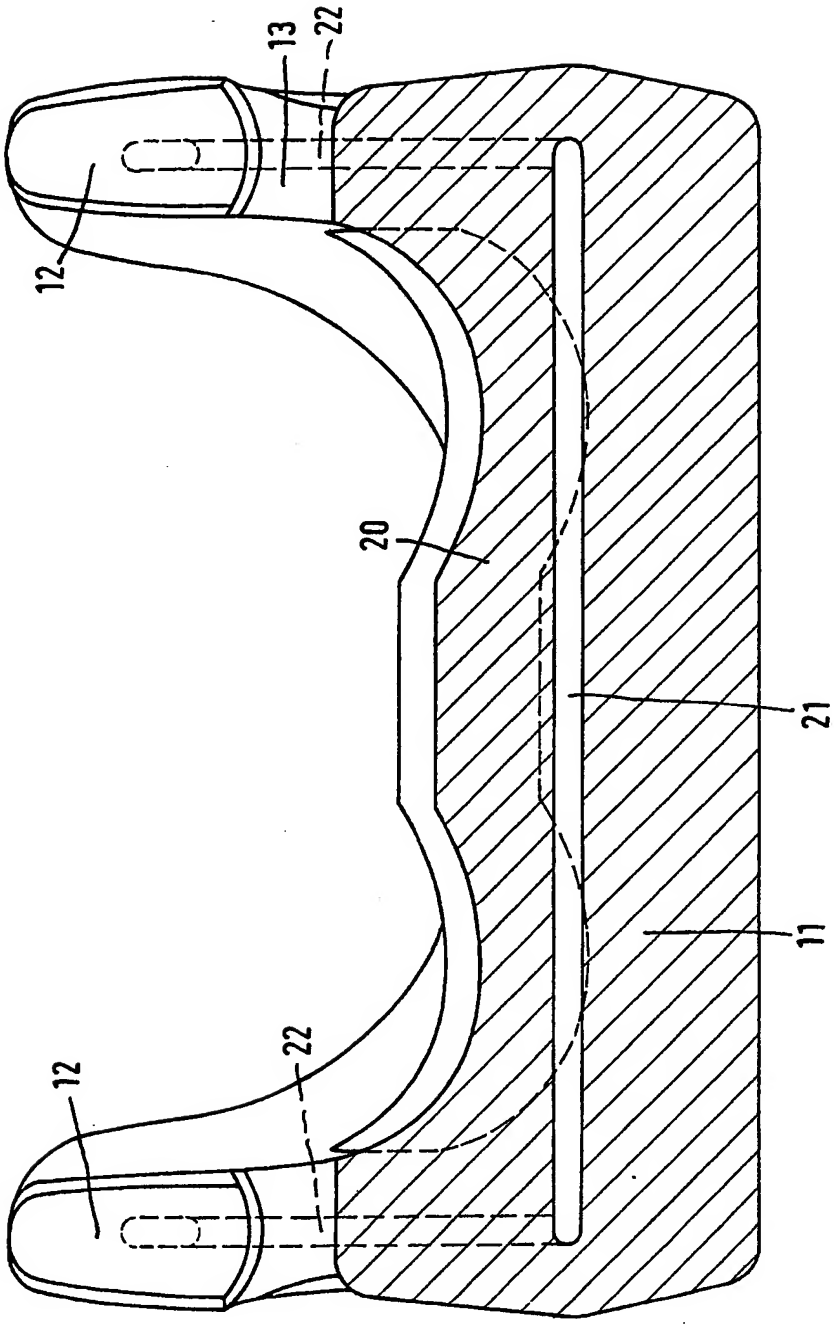

Fig.5

SPECIFICATION

Improvements in children's safety seats

The invention relates to children's safety seats, particularly although not exclusively for motor vehicles, consisting of a substantially cushion-like moulded part made of flexible plastics with a seat surface and support walls on both sides, attachment and/or guide means for a safety belt, preferably a three-point belt, being provided on the moulded part.

A child's safety seat of this kind, which is already known and in common use, is produced as a one-piece expanded plastics foam moulding. The surface of the foam forms a smooth skin corresponding to the shape of the moulded part. This involves problems of perspiration for the seated child. Moreover, the crushing force of the seat as whole is always of a uniform magnitude, and finally the known seat has a comparatively high specific density and hence overall weight, which in any case is a function of the safety requirements.

The aim of the invention is to improve the known child's safety seat of the above-mentioned kind, which has proved advantageous and satisfactory, so that, even on a long journey, the seated child is not subjected to accumulations of heat which make him restless, and moreover so that the weight and hence the age of the child can be taken into consideration with regard to the comfort of the seat and finally so that the overall weight of the seat can be reduced whilst the degree of safety is unimpaired.

According to the invention there is provided a child's safety seat consisting of a substantially cushion-like moulded part made of flexible plastics with a seat surface and support walls on both sides, attachment and/or guide means for a safety belt being provided on the moulded part, in which the moulded part is provided, at least in the region of the seat surface, with a removable seat base of an air-permeable nature and is formed, at the boundaries of the base with the openings of associated channels of which open out at their other ends at the underside or at the side surfaces of the moulded part.

As a result of the invention, there is the advantage that the seat surface of the child's seat can breathe and there is improved hygiene if the seat should become wet, for example. Finally, the child's seat can also easily be made to match the colour scheme of the upholstery of the vehicle in question, if the seat base is given a suitable covering.

With the additional features recited in the dependent claims, the child's safety seat can additionally be stabilised with regard to the absorption of longitudinal and transverse forces, in relation not only to the stress occurring under normal circumstances but also to that occurring in the case of an accident.

In order that the invention may be readily understood an embodiment thereof will now be described by way of example with reference to the accompanying drawings, in which:—

Fig. 1 is a vertical section through a child's safety seat on the line I—I in Fig. 2,

Fig. 2 is a view of the safety seat from above,

Fig. 3 is a vertical section on the line III—III in Fig. 2,

Fig. 4 is a side view of the safety seat,

Fig. 5 is a vertical section on the line V—V in Fig. 2.

The child's safety seat consists of a moulded part 10 with a cushion-like seat portion 11 and two lateral support walls 12 which may also serve as arm rests. The walls 12 are provided, at the front, with recesses 13 for the insertion of a safety belt (not shown), preferably a three-point safety belt. The moulded part 10 is integrally produced from foam plastics material with closed cells and has a smooth surface which is not shown in the drawing. The foam plastics material has a uniform crushing force.

Formed in the upper surface of the seat portion 11 is a substantially square depression 14 the depth of which is approximately one-third of the thickness of the seat portion 11. The size of the outline of the depression 14 corresponds to the actual sitting area of the seated child, i.e. the surface of contact with the child's bottom and the adjacent parts of the upper thighs, as can be seen in Figure 2, in particular. The depression 14 is surrounded by vertical walls and correspondingly raised portions formed in the seat portion 11. In the embodiment shown by way of example, the base surface 15 of the depression 14 has nine apertures 16 (Fig. 2) which are arranged in a U-shape on the base surface 15, i.e. under the buttocks and upper thighs of the seated child. The apertures 16 are the entrances of channels 17 extending substantially vertically through the seat portion 11 (Fig. 1), these channels increasing in diameter towards the bottom and ending at the underside of the seat portion 11. To enable the channels 17 to communicate with one another on the underside of the seat portion 11, a recessed portion 18 is provided there. The tubular edge zones 19 of the channels 17 are reinforced, by methods known in the art, during the production of the moulded part 10, so as to stabilise the base surface 15.

In the depression 14 in the seat portion 11, there is a seat base 20 which is made from foam rubber or foam plastics with open pores and which is substantially in the form of a flat cushion. The upper surface of the seat base 20 is shaped so as to fit the shape of the relevant parts of the body of the seated child, so as to ensure that these parts of the body are comfortably supported even during long journeys. The specific density of the material from which the seat base 20 is made is less than that of the moulded part 10. The seat base 20 may be provided with a textile covering (not shown in the drawing) the colour or pattern of which matches the upholstery of the vehicle in question.

In the case of the seat base 20 shown in the drawing, this base is frictionally held in place in

the depression 14, i.e. the seat base 20 is fitted tightly into the depression 14 so as to be firmly and immovably mounted therein. The thickness of the seat base 20 is somewhat greater than the depth of the depression 14, with the result that the seat base 20 can easily be grasped and pulled upwards in order to remove it from the depression 14. Consequently, the seat base 20 can easily be changed. Seat bases 20 with foam material having various crushing forces can be made available, in accordance with the age and hence the size and weight of the child in question, thereby again helping to optimise the comfort of the seat and thus contributing to the comfort of the parts of the child's body on which the weight is placed.

The seat base 20 can readily be removed from the moulded part 10 both for ease of cleaning and also in order to replace it by a seat base with a different crushing force. When in use, the seat base is prevented from moving around by the walls of the depression 14 and the raised portions provided around it. Once a child is sitting on the seat base 20, the accumulation of heat with resultant perspiration and a corresponding build-up of odour is prevented by the possibility of extensive circulation of air through the channels 17 and the pores of the foam material of the seat base 20.

As can be seen from Figs. 4 and 5, in particular, a steel wire reinforcement is embedded in the moulded part 10 of the child's safety seat, this reinforcement consisting of a U-shaped base piece 21 and two right-angled pieces 22 connected thereto. The reinforcement strengthens the moulded part 10, which is reduced in cross section by the depression 14 and channels 17, so as to stabilise it against deformation under load during the journey, and it also serves to absorb any forces which occur in the case of an accident.

The features of the object of the application disclosed in the patent claims, in the description and in the drawings may be essential to the invention with its various embodiments, either individually or in any desired combinations.

CLAIMS

1. A child's safety seat, consisting of a substantially cushion-like moulded part made of flexible plastics with a seat surface and support walls on both sides, attachment and/or guide means for a safety belt, being provided on the moulded part, in which the moulded part is provided, at least in the region of the seat surface, with a removable seat base of an air-permeable nature and is formed, at the boundaries of the base, with the openings of associated channels of which open out at their other ends at the underside or at the side surfaces of the moulded part.

2. A child's safety seat according to claim 1 in which the seat base consists of open-pored foam material.

3. A child's safety seat according to claim 1 or 2, in which the seat base is provided with a textile covering.

4. A child's safety seat according to any of the preceding claims in which the seat surface of the seat base is adapted in shape to the associated body contours of a child.

5. A child's safety seat according to any of the preceding claims in which the seat base is held in a correspondingly shaped depression in the moulded part.

6. A child's safety seat according to claim 5 in which the seat base is tensionally secured in the depression.

7. A child's safety seat according to any of claims 1 to 5, in which the seat base is secured to the moulded part by tapes, hooks and eyes.

8. A child's safety seat according to any of claims 1 to 5 in which the seat base is secured to the moulded part or in the depression by hooked attachment strips.

9. A child's safety seat according to any of the preceding claims in which the edge zones of the channels are reinforced.

10. A child's safety seat according to any of the preceding claims in which the openings of the channels are arranged adjacent to the seat base in the area of direct contact with the seated child.

11. A child's safety seat according to any of the preceding claims in which the channels are constructed so as to taper progressively in cross section towards the opening below the seat base.

12. A child's safety seat according to claim 10 or 11 in which the channels pass transversely by the shortest route through the moulded part.

13. A child's safety seat according to any of the preceding claims in which a steel reinforcement is mounted in the moulded part extending substantially around the seat base.

14. A child's safety seat according to claim 13, in which the steel reinforcement consists of a steel wire piece which surrounds the seat base at the front and on both sides.

15. A child's safety seat according to claim 13 or 14, in which the steel reinforcement also extends into the support walls on both sides.

16. A child's safety seat substantially as hereinbefore described with reference to the accompanying drawings.

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